REMARKS

This is a full and timely response to the non-final Official Action mailed November 28, 2003 (Paper No. 4). Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

By the forgoing amendment, various claims have been amended. Additionally, claim 15 has been cancelled and new claims 30-44 have been added. Thus, claims 1-14 and 16-44 currently pending for the Examiner's consideration.

With regard to the prior art, the recent Office Action rejected claims 1-6 and 14-23 as anticipated by U.S. Patent No. 6,118,474 to Nayar ("Nayar"). The other dependent claims were rejected as unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Nayar and various other secondary references. For at least the following reasons, Applicant respectfully traverses these rejections.

Claim 14 recites:

> An improved imaging apparatus for generating a two-dimensional image, comprising:
> a reflective mirror configured to satisfy an optical single viewpoint constraint for reflecting an image scene;
> an image sensor responsive to said reflective mirror and that generates two dimensional image data signals to obtain an omnidirectional image on an image plane; and
> a controller coupled to the image sensor, wherein the controller defines a perspective viewing window and includes a mapping matrix generator that defines a geometric relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window.

Claim 1 recites similar subject matter in the form of a method claim.

In contrast, Nayar fails to teach or suggest many of the features of claims 1 and 14.

For example, Applicant recites "a reflective mirror configured to satisfy an optical single viewpoint constraint for reflecting an image scene." Applicant's specification defines the "single viewpoint constraint" as follows: "each pixel in the image corresponds to a particular viewing direction defined by a ray from that pixel on an image plane through a single viewing point such that all of the light rays are directed to a single virtual viewing point." (Applicant's Spec., para. 26). Applicant also specifically notes that conical, hemispherical and parabolic reflectors (See Figs. 2a-2c) do not satisfy this condition. "[T]he convex mirrors shown in FIGS. 2a through 2c can increase the field of view but are not satisfactory imaging devices because the reflecting surfaces of the mirrors do not meet the single viewpoint constraint, which is desirable for a high-quality omnidirectional imaging system." (Applicant's Spec., para. 26).

Nayar only teaches hemispherical and parabolic reflectors. Consequently, Nayar cannot teach or suggest the claimed "reflective mirror configured to satisfy an optical single viewpoint constraint for reflecting an image scene."

Applicant further recites "a controller coupled to the image sensor, wherein the controller defines a perspective viewing window and includes a mapping matrix generator that defines a geometric relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window." This subject matter is also not taught or suggested by Nayar.

Nayar simply teaches a "one-to-one correspondence between the x-y coordinate of the point of intersection with the reflector 135 of the orthographically projected ray, and the x-y coordinate of the point at which that orthographically projected ray intersects the planar light-sensitive surface of the image sensor 110." (Col. 10, lines 14-19). In other words, the reflector collimates light onto the image sensor as shown by Nayar in Fig. 1a.

Nayar does not teach or suggest a controller, as claimed, having a "mapping matrix generator that defines a geometric relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window." Nayar does mention in passing "mapping the image data into an appropriate coordinate system." (Col. 12, lines 26-27). Applicant is not necessarily claiming mapping image data into a new coordinate system. Applicant is claiming mapping the two-dimensional omnidirectional image to a two-dimensional perspective viewing window based on a geometric relationship between the image plane of the image sensor and the perspective viewing window for the purpose of reducing distortion in the image. (Applicant's Spec., para. 31).

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. As demonstrated, Nayar fails to teach or suggest the "reflective mirror configured to satisfy an optical single viewpoint constraint." Nayar also fails to teach or suggest "a controller coupled to the image sensor, wherein the controller defines

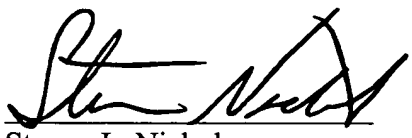
a perspective viewing window and includes a mapping matrix generator that defines a geometric relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window." Therefore, the rejection based on Nayar of claims 1-29 should be reconsidered and withdrawn.

The newly added claims are thought to be patentable over the prior art of record for at least the same reasons given above with respect to claims 1 and 14. Therefore, examination and allowance of the newly added claims is respectfully requested.

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If any fees are owed in connection with this paper which have not been elsewhere authorized, authorization is hereby given to charge those fees to Deposit Account 18-0013 in the name of Rader, Fishman & Grauer PLLC. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

DATE: 26 February 2004



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